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10/735,433	12/12/2003	Sudarshan Palliyll	JP920030163US1	2308

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EXAMINER
DWIVEDI, MAHESH H

ART UNIT	PAPER NUMBER
2168	

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Please find below and/or attached an Office communication concerning this application or proceeding.

## *Office Action Summary*	**Application No.** 10/735,433	**Applicant(s)** PALLIYLL ET AL.
	Examiner Mahesh H. Dwivedi	**Art Unit** 2168

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 August 2006*.

2a)□ This action is **FINAL**. 2b)☒ This action is non-final.

3)□ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18 and 30-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)□ Claim(s) _____ is/are allowed.

6)□ Claim(s) *1-18 and 30-32* is/are rejected.

7)□ Claim(s) _____ is/are objected to.

8)□ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)□ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 December 2003* is/are: a)☒ accepted or b)□ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)□ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)□ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)□ All b)□ Some * c)□ None of:

1.□ Certified copies of the priority documents have been received.

2.□ Certified copies of the priority documents have been received in Application No. _____.

3.□ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) □ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date *6/23/2004*.

4) □ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) □ Notice of Informal Patent Application (PTO-152)

6) □ Other: _____.

DETAILED ACTION

Remarks

1. The examiner notes that the inventive entity **"Palliyll"** of the instant application is not spelled in the same way as is specified in the oath of the specification (see oath, where the inventive entity is spelled as **"Palliyil"**). The examiner requests applicant to submit which spelling configuration of the aforementioned inventive entity is the correct one.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 06/24/2004 has been received, entered into the record, and considered. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

The examiner notes that under the disclosed reference of U.S. Patent 6,480,097, the name of Patentee is incorrectly stated as **"Bohm et al."**. The examiner notes that the inventor of the aforementioned patent is not **Bohm et al.**, but rather **Zinsky et al.** The examiner is not considering the aforementioned patent.

Election/Restrictions

3. Applicant's election without traverse of Group I (Claims 1-18 and 30-32) in the reply filed on 08/07/2006 is acknowledged. Group II, (Claims 19-29), are withdrawn from further consideration by the examiner, 37 CFR 1.142(b) as being drawn to a non-elected.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 17-18 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 17-18 appears to represent nonfunctional descriptive material. Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data. When nonfunctional descriptive material is recorded on some computer-readable medium, in a computer or on an electromagnetic carrier signal, it is not statutory since no requisite functionality is present to satisfy the practical application requirement. Merely claiming nonfunctional descriptive material, i.e., abstract ideas, stored in a computer-readable medium, in a computer, on an electromagnetic carrier signal does not make it statutory. See Diehr, 450 U.S. at 185-86, 209 USPQ at 8 (noting that the claims for an algorithm in Benson were unpatentable as abstract ideas because

"[t]he sole practical application of the algorithm was in connection with the programming of a general purpose computer."). Such a result would exalt form over substance. See also In re Johnson, 589 F.2d 1070, 1077, 200 USPQ 199, 206 (CCPA 1978) ("form of the claim is often an exercise in drafting"). Thus, nonstatutory music is not a computer component and it does not become statutory by merely recording it on a compact disk. Protection for this type of work is provided under the copyright law.

Claims 17-18 are further rejected under 35 U.S.C 101 because the claimed invention is directed to the non-statutory subject area of electro-magnetic signals, carrier waves. Claims 17-18 each recite the limitation **"a computer program product comprising program code recorded on a recording medium"**. The examiner interprets **"recording medium"** as a machine defined by the characteristics in Page 11, lines 23-30-Page 12, lines 1-3 of the applicant's specification. According to Page 11, lines 25-30 of the applicant's specification, a recording medium comprises "transmission medium for communicating the computer program between a source and a destination. The transmission medium may include storage devices such as **magnetic or optical disks**, memory chips, or other storage devices suitable for interfacing with a general-purpose computer. The transmission medium may also include a hard-wired medium such as exemplified by typical Internet-connected server computers, or a wireless medium such as exemplified in the GSM mobile telephone system". Claims 17-18 recite nothing but the physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism, per se, and as such are nonstatutory natural phenomena. O'Reilly, 56 U.S. (15 How.) at 112-14.

Moreover, a claim reciting a signal encoded with functional descriptive material does not fall within any of the categories of patentable subject matter set forth in § 101. First, a claimed signal is clearly not a "process" under § 101 because it is not a series of steps. The other three § 101 classes of machine, compositions of matter and manufactures "relate to structural entities and can be grouped as 'product' claims in order to contrast them with process claims." 1 D. Chisum, Patents § 1.02 (1994). The three product classes have traditionally required physical structure or material. "The term machine includes every mechanical device or combination of mechanical device or combination of mechanical powers and devices to perform some function and produce a certain effect or result." Corning v. Burden, 56 U.S. (15 How.) 252, 267 (1854). A modern definition of machine would no doubt include electronic devices which perform functions. Indeed, devices such as flip-flops and computers are referred to in computer science as sequential machines. A claimed signal has no physical structure, does not itself perform any useful, concrete and tangible result and, thus, does not fit within the definition of a machine. A "composition of matter" "covers all compositions of two or more substances and includes all composite articles, whether they be results of chemical union, or of mechanical mixture, or whether they be gases, fluids, powders or solids." Shell Development Co. v. Watson, 149 F. Supp. 279, 280, 113 USPQ 265, 266 (D.D.C. 1957), aff'd, 252 F.2d 861, 116 USPQ 428 (D.C. Cir. 1958). A claimed signal is not matter, but a form of energy, and therefore is not a composition of matter. The Supreme Court has read the term "manufacture" in accordance with its dictionary definition to mean "the production of articles for use from raw or prepared materials by giving to these materials new forms, qualities, properties, or combinations, whether by hand-labor or by machinery." Diamond v. Chakrabarty, 447 U.S. 303, 308, 206 USPQ 193, 196-97 (1980) (quoting American Fruit Growers, Inc. v. Brogdex Co., 283 U.S. 1, 11, 8 USPQ 131, 133 (1931), which, in turn, quotes the Century Dictionary). Other courts have applied similar definitions. See American Disappearing Bed Co. v. Arnaelsteen, 182 F. 324, 325 (9th Cir. 1910), cert. denied, 220 U.S. 622 (1911). These definitions require physical substance, which a claimed signal does not have. Congress can be presumed to be aware of an administrative or judicial interpretation of a statute and to adopt that interpretation when it re-enacts a statute without change. Lorillard v. Pons, 434 U.S. 575, 580 (1978). Thus, Congress must be presumed to have been aware of the interpretation of manufacture in American Fruit Growers when it passed the 1952 Patent Act. A manufacture is also defined as the residual class of product. 1 Chisum, § 1.02[3] (citing W. Robinson, The Law of Patents for Useful Inventions 270 (1890)). A product is a tangible physical article or object, some form of matter, which a signal is not. That the other two product classes, machine and composition of matter, require physical matter is evidence that a manufacture was also intended to require physical matter. A signal, a form of energy, does not fall within either of the two definitions of manufacture. Thus, a signal does not fall within one of the four statutory classes of § 101.

To expedite a complete examination of the instant application, the claims rejected under 35 U.S.C. 101 (nonstatutory) above are further rejected as set forth below in anticipation of applicant amending these claims to place them within the four categories of invention.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 16 recites the limitation **"data processing network of claim 14"** in Page 49, line 19. There is insufficient antecedent basis for this limitation in the claim, as claim 14 is a data processing apparatus.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-2, 6-18 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by **Vermeulen** (U.S. PGPUB 2001/0042171).

10. Regarding claim 1, **Vermeulen** teaches a method comprising:

A) computing a set of hash values representing a set of resources stored in association with at least one data processing system within the network (Paragraphs 20 and 24);

B) storing the computed set of hash values (Paragraphs 24 and 32, Figure 5);

C) in response to a requirement for access to a first resource which is accessible via a bandwidth-sensitive connection, retrieving a hash value derived from the required first resource (Paragraph 24);

D) comparing the retrieved hash value with the stored set of hash values to identify a match between the retrieved hash value and any of the stored set of hash values (Paragraph 24);

E) in response to identifying a match for the retrieved hash value, initiating retrieval of the required first resource from said at least one data processing system (Paragraph 24); and,

F) if no match is identified for the retrieved hash value, retrieving the required first resource via said bandwidth-sensitive connection (Paragraph 24).

The examiner notes that **Vermeulen** teaches **"computing a set of hash values representing a set of resources stored in association with at least one data processing system within the network"** as "a basic idea of this invention is to compute a hash code from a file via a given algorithm and to use this hash code to check whether a file to be loaded is already contained in the cache or not" (Paragraph 20) and "Server 14 then computes the hash code of this file 23" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"storing the computed set of hash values"** as "Directory 52 contains a list of the hash codes of the stored files" (Paragraph 32). The examiner further notes that **Vermeulen** teaches **"in response to a requirement for access to a first resource which is accessible via a bandwidth-**

sensitive connection, retrieving a hash value derived from the required first resource" as "Client therefore sends a file request 21 with the address of the requested file to proxy server 12. To be able to check its cache as to whether the requested file is contained therein, proxy server 12 needs the hash code belonging to the file. It therefore sends to remote server 14 a hash request 22 in which the requested file is specified with its address. Server 14 then computes the hash code of this file, 23, and sends a message containing the computed hash code back to the Proxy server" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"comparing the retrieved hash value with the stored set of hash values to identify a match between the retrieved hash value and any of the stored set of hash values"** as "Proxy server 12 compares the hashes, 25, to determine whether the requested file is contained in the cache memory or not" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"in response to identifying a match for the retrieved hash value, initiating retrieval of the required first resource from said at least one data processing system"** as "If the file is already in the cache, it will be immediately transferred, 28, to the client" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"if no match is identified for the retrieved hash value, retrieving the required first resource via said bandwidth-sensitive connection"** as "If the requested file is not in the cache, proxy server 12 will send a "send file" request, 26, to remote server 14, which then transfers the file, 27, to the proxy server, which stores it in its cache memory and transfers it, 28, to client 11" (Paragraph 24).

Regarding claim 2, **Vermeulen** further teaches a method comprising:

A) wherein the step of retrieving the hash value derived from the required first resource comprises: sending a resource access request to a server computer via the bandwidth-sensitive connection (Paragraph 24); and

B) receiving the hash value from the server computer via the bandwidth-sensitive connection (Paragraphs 22-24, Figure 1).

The examiner notes that **Vermeulen** teaches **"wherein the step of retrieving the hash value derived from the required first resource comprises: sending a resource access request to a server computer via the bandwidth-sensitive connection"** as "If the requested file is not in the cache, proxy server 12 will send a "send file" request, 26, to remote server 14, which then transfers the file, 27, to the proxy server, which stores it in its cache memory and transfers it, 28, to client 11" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"receiving the hash value from the server computer via the bandwidth-sensitive connection"** as "Client therefore sends a file request 21 with the address of the requested file to proxy server 12. To be able to check its cache as to whether the requested file is contained therein, proxy server 12 needs the hash code belonging to the file. It therefore sends to remote server 14 a hash request 22 in which the requested file is specified with its address. Server 14 then computes the hash code of this file, 23, and sends a message containing the computed hash code back to the Proxy server" (Paragraph 24).

Regarding claim 6, **Vermeulen** teaches a method comprising:

A) computing a set of hash values representing a set of resources distributed across a plurality of data processing systems within a local area network (LAN), the resources within said set of resources being accessible from respective ones of the plurality of data processing systems (Paragraphs 20 and 24);

B) storing the set of hash values together with an identification of a respective data processing system of said plurality of data processing systems storing the resource corresponding to each of the set of hash values (Paragraph 32);

C) in response to a requirement for access to a resource which is stored at a remote data processing system, retrieving from the remote data processing system a hash value derived from the required resource (Paragraph 24);

D) comparing the retrieved hash value with the stored set of hash values to identify a match between the retrieved hash value and any of the stored set of hash values (Paragraph 24);

E) in response to identifying a match for the retrieved hash value, initiating retrieval of the required resource from a respective one of the plurality of data processing systems at which the resource corresponding to the matched hash value is stored (Paragraph 24); and

F) if no match is identified for the retrieved hash value, retrieving the required resource from said remote data processing system (Paragraph 24).

The examiner notes that **Vermeulen** teaches **"computing a set of hash values representing a set of resources distributed across a plurality of data processing systems within a local area network (LAN), the resources within said set of**

resources being accessible from respective ones of the plurality of data processing systems" as "a basic idea of this invention is to compute a hash code from a file via a given algorithm and to use this hash code to check whether a file to be loaded is already contained in the cache or not" (Paragraph 20) and "Server 14 then computes the hash code of this file 23" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"storing the set of hash values together with an identification of a respective data processing system of said plurality of data processing systems storing the resource corresponding to each of the set of hash values"** as "Directory 52 contains a list of the hash codes of the stored files and, for each hash code, the memory address at which the associated file is stored in the second memory area 53" (Paragraph 32). The examiner further notes that **Vermeulen** teaches **"in response to a requirement for access to a resource which is stored at a remote data processing system, retrieving from the remote data processing system a hash value derived from the required resource"** as "Client therefore sends a file request 21 with the address of the requested file to proxy server 12. To be able to check its cache as to whether the requested file is contained therein, proxy server 12 needs the hash code belonging to the file. It therefore sends to remote server 14 a hash request 22 in which the requested file is specified with its address. Server 14 then computes the hash code of this file, 23, and sends a message containing the computed hash code back to the Proxy server" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"comparing the retrieved hash value with the stored set of hash values to identify a match between the retrieved hash value and any of the**

stored set of hash values" as "Proxy server 12 compares the hashes, 25, to determine whether the requested file is contained in the cache memory or not" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"in response to identifying a match for the retrieved hash value, initiating retrieval of the required resource from a respective one of the plurality of data processing systems at which the resource corresponding to the matched hash value is stored"** as "If the file is already in the cache, it will be immediately transferred, 28, to the client" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"if no match is identified for the retrieved hash value, retrieving the required resource from said remote data processing system"** as "If the requested file is not in the cache, proxy server 12 will send a "send file" request, 26, to remote server 14, which then transfers the file, 27, to the proxy server, which stores it in its cache memory and transfers it, 28, to client 11" (Paragraph 24).

Regarding claim 7, **Vermeulen** further teaches a method comprising:

A) wherein the set of hash values and identification of a respective data processing system are stored with information regarding the location within storage of the respective data processing system of the resource corresponding to the hash value (Paragraph 32).

The examiner notes that **Vermeulen** teaches **"wherein the set of hash values and identification of a respective data processing system are stored with information regarding the location within storage of the respective data**

processing system of the resource corresponding to the hash value" as "Directory 52 contains a list of the hash codes of the stored files and, for each hash code, the memory address at which the associated file is stored in the second memory area 53" (Paragraph 32).

Regarding claim 8, **Vermeulen** teaches a method comprising:

A) computing a set of hash values representing a set of resources distributed across a plurality of data processing systems within the network, the resources within said set of resources being accessible from respective ones of the plurality of data processing systems (Paragraphs 20 and 24);

B) storing the set of hash values together with an identification of a respective data processing system of said plurality of data processing systems storing the resource corresponding to each of the set of hash values (Paragraph 32);

C) in response to a requirement for access to a resource which is accessible via a bandwidth-sensitive connection, retrieving a hash value derived from the required resource (Paragraph 24);

D) comparing the retrieved hash value with the stored set of hash values to identify a match between the retrieved hash value and any of the stored set of hash values (Paragraph 24);

E) in response to identifying a match for the retrieved hash value, retrieving the required resource from a respective one of the plurality of data processing systems at which the resource corresponding to the matched hash value is stored (Paragraph 24); and

F) if no match is identified for the retrieved hash value, retrieving the required resource via the bandwidth-sensitive connection (Paragraph 24).

The examiner notes that **Vermeulen** teaches **"computing a set of hash values representing a set of resources distributed across a plurality of data processing systems within the network, the resources within said set of resources being accessible from respective ones of the plurality of data processing systems"** as "a basic idea of this invention is to compute a hash code from a file via a given algorithm and to use this hash code to check whether a file to be loaded is already contained in the cache or not" (Paragraph 20) and "Server 14 then computes the hash code of this file 23" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"storing the set of hash values together with an identification of a respective data processing system of said plurality of data processing systems storing the resource corresponding to each of the set of hash values"** as "Directory 52 contains a list of the hash codes of the stored files and, for each hash code, the memory address at which the associated file is stored in the second memory area 53" (Paragraph 32). The examiner further notes that **Vermeulen** teaches **"in response to a requirement for access to a resource which is accessible via a bandwidth-sensitive connection, retrieving a hash value derived from the required resource"** as "Client therefore sends a file request 21 with the address of the requested file to proxy server 12. To be able to check its cache as to whether the requested file is contained therein, proxy server 12 needs the hash code belonging to the file. It therefore sends to remote server 14 a hash request 22 in which the requested file is specified with its address. Server 14 then computes the hash code of this file, 23, and sends a message containing the computed hash code back to the Proxy server" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"comparing the retrieved hash value with the stored set of hash values to identify a match between the retrieved hash value and any of the stored set of hash values"** as "Proxy server 12 compares the hashes, 25, to determine whether the requested file is contained in the cache memory or not" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"in response to identifying a match for the retrieved hash value, retrieving the required resource from a respective one of the plurality of data processing systems at which the resource corresponding to the matched hash value is stored"** as "If the file is already in the cache, it will be immediately transferred, 28, to the client" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"if no match is identified for the retrieved hash value, retrieving the required resource via the bandwidth-sensitive connection"** as "If the requested file is not in the cache, proxy server 12 will send a "send file" request, 26, to remote server 14, which then transfers the file, 27, to the proxy server, which stores it in its cache memory and transfers it, 28, to client 11" (Paragraph 24).

Regarding claim 9, **Vermeulen** teaches a data processing apparatus comprising:

A) a data processing unit (Paragraph 26);

B) a data storage unit for storing a set of hash values representing a set of resources available from a first set of data processing systems (Paragraph 32, Figure 5); and

C) a repository manager for comparing a received hash value with the stored set of hash values to identify a match between a received hash value and any of the stored hash values (Paragraph 24);

D) wherein the repository manager is configured to respond to identification of a match between a stored hash value and a received hash value representing a required resource, by outputting a confirmation that the required resource is available from a data processing system of the first set of data processing systems (Paragraph 24).

The examiner notes that **Vermeulen** teaches **"a data processing unit"** as "Processor 32 controls the operations of the proxy server. It executes a control program stored in main memory 34 and containing a sequence of control instructions, and is programmed to perform the functions described in connections with FIG. 2, i.e., requesting the hash code from the remote server using the address of the file requested by the client...for example" (Paragraph 26) and "Server 14 then computes the hash code of this file 23" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"a data storage unit for storing a set of hash values representing a set of resources available from a first set of data processing systems"** as "Directory 52 contains a list of the hash codes of the stored files and, for each hash code, the memory address at which the associated file is stored in the second memory area 53" (Paragraph 32). The examiner further notes that **Vermeulen** teaches **"a repository manager for comparing a received hash value with the stored set of hash values**

to identify a match between a received hash value and any of the stored hash values" as "Proxy server 12 compares the hashes, 25, to determine whether the requested file is contained in the cache memory or not" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"wherein the repository manager is configured to respond to identification of a match between a stored hash value and a received hash value representing a required resource, by outputting a confirmation that the required resource is available from a data processing system of the first set of data processing systems"** as "If the file is already in the cache, it will be immediately transferred, 28, to the client" (Paragraph 24).

Regarding claim 10, **Vermeulen** further teaches a data processing apparatus comprising:

A) wherein the repository manager is configured to respond to identification of a match between a stored hash value and a received hash value representing a required resource, by outputting an identification of the location of the required resource at a data processing system of the first set of data processing systems (Paragraph 24).

The examiner further notes that **Vermeulen** teaches **"wherein the repository manager is configured to respond to identification of a match between a stored hash value and a received hash value representing a required resource, by outputting an identification of the location of the required resource at a data processing system of the first set of data processing systems"** as "Directory 52 contains a list of the hash codes of the stored files and, for each hash code, the memory address at which the associated file is stored in the second memory area 53" (Paragraph 32) and "Proxy server 12 compares the hashes, 25, to determine whether the requested file is contained in the cache memory or not. If the file is already in the cache, it will immediately be transferred" (Paragraph 24).

Regarding claim 11, **Vermeulen** further teaches a data processing apparatus comprising:

A) wherein the repository manager is configured to perform said comparison in response to a request for a resource from a requestor program (Paragraph 24); and

B) wherein the repository manager is configured to respond to identification of a match between a stored hash value and a received hash value representing a required resource by obtaining a copy of the required resource and forwarding the obtained copy to the requestor program (Paragraph 24).

The examiner further notes that **Vermeulen** teaches **"wherein the repository manager is configured to perform said comparison in response to a request for a resource from a requestor program"** as "Client therefore sends a file request 21 with the address of the requested file to proxy server 12. To be able to check its cache as to whether the requested file is contained therein, proxy server 12 needs the hash code belonging to the file. It therefore sends to remote server 14 a hash request 22 in which the requested file is specified with its address. Server 14 then computes the hash code of this file, 23, and sends a message containing the computed hash code back to the Proxy server" (Paragraph 24). The examiner further notes that **Vermeulen** teaches

"wherein the repository manager is configured to respond to identification of a match between a stored hash value and a received hash value representing a required resource by obtaining a copy of the required resource and forwarding the obtained copy to the requestor program" as "Directory 52 contains a list of the hash codes of the stored files and, for each hash code, the memory address at which the associated file is stored in the second memory area 53" (Paragraph 32) and "Proxy server 12 compares the hashes, 25, to determine whether the requested file is contained in the cache memory or not. If the file is already in the cache, it will immediately be transferred" (Paragraph 24).

Regarding claim 12, **Vermeulen** further teaches a data processing apparatus comprising:

A) a secure hashing function for computing hash values representing resources that are available from the first set of data processing systems (Paragraph 21).

The examiner further notes that **Vermeulen** teaches **"a secure hashing function for computing hash values representing resources that are available from the first set of data processing systems"** as "The algorithm described there, the MD5 algorithm, can be used to advantage in the invention since it is fast and generates a hash code with which the risk of two different files generating the same hash is extremely small" (Paragraph 21).

Regarding claim 13, **Vermeulen** teaches a data processing apparatus comprising:

A) a data processing unit (Paragraph 26);

B) a secure hashing function for computing a hash value representing at least one resource (Paragraph 21);

C) a data storage unit for storing said at least one resource in association with the computed hash value (Paragraph 32, Figure 5); and

D) a resource access manager configured to respond to a request from a requestor for access to said at least one resource by sending to the requester the computed hash value representing the at least one resource (Paragraph 24).

The examiner notes that **Vermeulen** teaches **"a data processing unit"** as "Processor 32 controls the operations of the proxy server. It executes a control program stored in main memory 34 and containing a sequence of control instructions, and is programmed to perform the functions described in connections with FIG. 2, i.e., requesting the hash code from the remote server using the address of the file requested by the client...for example" (Paragraph 26) and "Server 14 then computes the hash code of this file 23" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"a secure hashing function for computing a hash value representing at least one resource"** as "The algorithm described there, the MD5 algorithm, can be used to advantage in the invention since it is fast and generates a hash code with which the risk of two different files generating the same hash is extremely small" (Paragraph 21). The examiner further notes that **Vermeulen** teaches **"a data storage unit for**

storing said at least one resource in association with the computed hash value" as "Directory 52 contains a list of the hash codes of the stored files and, for each hash code, the memory address at which the associated file is stored in the second memory area 53" (Paragraph 32). The examiner further notes that **Vermeulen** teaches **"a resource access manager configured to respond to a request from a requestor for access to said at least one resource by sending to the requester the computed hash value representing the at least one resource"** as "Client therefore sends a file request 21 with the address of the requested file to proxy server 12. To be able to check its cache as to whether the requested file is contained therein, proxy server 12 needs the hash code belonging to the file. It therefore sends to remote server 14 a hash request 22 in which the requested file is specified with its address. Server 14 then computes the hash code of this file, 23, and sends a message containing the computed hash code back to the Proxy server" (Paragraph 24)".

Regarding claim 14, **Vermeulen** teaches a data processing apparatus comprising:

A) a data processing unit (Paragraph 26);

B) a data storage unit (Paragraph 32, Figure 5); and

C) a resource access requestor configured to respond to a requirement for a resource which is accessible via a bandwidth-sensitive connection, by retrieving a secure hash value representing the required resource and sending the hash value representing the required resource to a repository manager (Paragraph 24);

D) to initiate comparison between the retrieved hash value and stored hash values representing resources accessible on a first set of data processing systems (Paragraph 24); and

E) thereby to determine whether the retrieved hash value matches any of the stored hash values (Paragraph 24);

F) wherein the resource access requester is configured to respond to identification of a match between the retrieved hash value and a stored hash value by initiating retrieval of the desired resource from a data processing system of the first set of data processing systems (Paragraph 24).

The examiner notes that **Vermeulen** teaches **"a data processing unit"** as "Processor 32 controls the operations of the proxy server. It executes a control program stored in main memory 34 and containing a sequence of control instructions, and is programmed to perform the functions described in connections with FIG. 2, i.e., requesting the hash code from the remote server using the address of the file requested by the client...for example" (Paragraph 26) and "Server 14 then computes the hash code of this file 23" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"a data storage unit"** as "Directory 52 contains a list of the hash codes of the stored files and, for each hash code, the memory address at which the associated file is stored in the second memory area 53" (Paragraph 32). The examiner further notes that **Vermeulen** teaches **"a resource access requestor configured to respond to a requirement for a resource which is accessible via a bandwidth-sensitive connection, by retrieving a secure hash value representing the required resource**

and sending the hash value representing the required resource to a repository manager" as "Client therefore sends a file request 21 with the address of the requested file to proxy server 12. To be able to check its cache as to whether the requested file is contained therein, proxy server 12 needs the hash code belonging to the file. It therefore sends to remote server 14 a hash request 22 in which the requested file is specified with its address. Server 14 then computes the hash code of this file, 23, and sends a message containing the computed hash code back to the Proxy server" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"to initiate comparison between the retrieved hash value and stored hash values representing resources accessible on a first set of data processing systems"** as "Proxy server 12 compares the hashes, 25, to determine whether the requested file is contained in the cache memory or not" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"thereby to determine whether the retrieved hash value matches any of the stored hash values"** as "Proxy server 12 compares the hashes, 25, to determine whether the requested file is contained in the cache memory or not" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"wherein the resource access requester is configured to respond to identification of a match between the retrieved hash value and a stored hash value by initiating retrieval of the desired resource from a data processing system of the first set of data processing systems"** as "If the file is already in the cache, it will be immediately transferred, 28, to the client" (Paragraph 24).

Regarding claim 15, **Vermeulen** teaches a data processing network comprising:

A) a data processing unit and a data storage unit for storing a set of hash values representing a set of resources available via the respective pool server data processing system (Paragraphs 26 and 32, Figure 5); and

B) a repository manager configured to compare a received hash value with the stored set of hash values to identify a match between a received hash value and any of the stored hash values (Paragraph 24);

C) wherein the repository manager is configured to respond to identification of a match between a stored hash value and a received hash value representing a required resource by outputting a confirmation that the required resource is available via the respective pool server data processing system (Paragraph 24).

The examiner notes that **Vermeulen** teaches **"a data processing unit and a data storage unit for storing a set of hash values representing a set of resources available via the respective pool server data processing system"** as "Processor 32 controls the operations of the proxy server. It executes a control program stored in main memory 34 and containing a sequence of control instructions, and is programmed to perform the functions described in connections with FIG. 2, i.e., requesting the hash code from the remote server using the address of the file requested by the client...for example" (Paragraph 26) and "Server 14 then computes the hash code of this file 23" (Paragraph 24) and "Directory 52 contains a list of the hash codes of the stored files and, for each hash code, the memory address at which the associated file is stored in the second memory area 53" (Paragraph 32). The examiner further notes that

Vermeulen teaches **"a repository manager configured to compare a received hash value with the stored set of hash values to identify a match between a received hash value and any of the stored hash values"** as "Proxy server 12 compares the hashes, 25, to determine whether the requested file is contained in the cache memory or not" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"thereby to determine whether the retrieved hash value matches any of the stored hash values"** as "Proxy server 12 compares the hashes, 25, to determine whether the requested file is contained in the cache memory or not" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"wherein the repository manager is configured to respond to identification of a match between a stored hash value and a received hash value representing a required resource by outputting a confirmation that the required resource is available via the respective pool server data processing system"** as "If the file is already in the cache, it will be immediately transferred, 28, to the client" (Paragraph 24).

Regarding claim 16, **Vermeulen** further teaches a data processing network comprising:

A) a set of client data processing systems each comprising a data storage unit storing at least one resource (Paragraph 24);

B) wherein each client data processing system is associated with a pool server data processing system (Paragraph 24); and

C) the repository manager of each pool server data processing system is configured to store hash values corresponding to a set of resources distributed across the respective set of associated client data processing systems (Paragraph 24).

Regarding claim 17, **Vermeulen** teaches a computer program product comprising:

A) a repository manager for comparing a received hash value with the stored set of hash values to identify a match between a received hash value and any of the stored hash values (Paragraph 24);

B) wherein the repository manager is configured to respond to identification of a match between a stored hash value and a received hash value representing a required resource by outputting a confirmation that the required resource is available from a data processing system of the first set of data processing systems (Paragraph 24).

The examiner notes that **Vermeulen** teaches **"a repository manager for comparing a received hash value with the stored set of hash values to identify a match between a received hash value and any of the stored hash values"** as "Proxy server 12 compares the hashes, 25, to determine whether the requested file is contained in the cache memory or not" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"wherein the repository manager is configured to respond to identification of a match between a stored hash value and a received hash value representing a required resource by outputting a confirmation that the required resource is available from a data processing system of the first set of data**

processing systems" as "If the file is already in the cache, it will be immediately transferred, 28, to the client" (Paragraph 24).

Regarding claim 18, **Vermeulen** teaches a computer program product comprising:

A) a resource access requestor configured to respond to a requirement for a resource which is accessible via a bandwidth-sensitive connection by retrieving a secure hash value representing the required resource (Paragraph 24); and

B) sending the hash value representing the required resource to a repository manager to initiate comparison between the retrieved hash value and stored hash values representing resources accessible on a first set of data processing systems (Paragraph 24);

C) thereby to determine whether the retrieved hash value matches any of the stored hash values (Paragraph 24);

D) wherein the resource access requestor is configured to respond to identification of a match between the retrieved hash value and a stored hash value by initiating retrieval of the desired resource from a data processing system of the first set of data processing systems (Paragraph 24).

The examiner notes that **Vermeulen** teaches **"a resource access requestor configured to respond to a requirement for a resource which is accessible via a bandwidth-sensitive connection by retrieving a secure hash value representing the required resource"** as "Client therefore sends a file request 21 with the address of the requested file to proxy server 12. To be able to check its cache as to whether the requested file is contained therein, proxy server 12 needs the hash code belonging to the file. It therefore sends to remote server 14 a hash request 22 in which the requested file is specified with its address. Server 14 then computes the hash code of this file, 23, and sends a message containing the computed hash code back to the Proxy server" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"sending the hash value representing the required resource to a repository manager to initiate comparison between the retrieved hash value and stored hash values representing resources accessible on a first set of data processing systems"** as "Client therefore sends a file request 21 with the address of the requested file to proxy server 12. To be able to check its cache as to whether the requested file is contained therein, proxy server 12 needs the hash code belonging to the file. It therefore sends to remote server 14 a hash request 22 in which the requested file is specified with its address. Server 14 then computes the hash code of this file, 23, and sends a message containing the computed hash code back to the Proxy server" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"thereby to determine whether the retrieved hash value matches any of the stored hash values"** as "Proxy server 12 compares the hashes, 25, to determine whether the requested file is contained in the cache memory or not" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"wherein the resource access requestor is configured to respond to identification of a match between the retrieved hash value and a stored hash value by initiating retrieval of the desired resource from a**

data processing system of the first set of data processing systems" as "If the file is already in the cache, it will be immediately transferred, 28, to the client" (Paragraph 24).

Regarding claim 30, **Vermeulen** teaches a method comprising:

A) computing a set of hash values representing a set of resources stored in a directory at the first data processing system (Paragraphs 20 and 24);

B) generating a directory template representing the structure of the directory including the locations within the directory of the resources represented by the set of hash values (Paragraphs 32 and 34);

C) sending the set of hash values and the directory template to the second data processing system (Paragraphs 24, 32, and 34);

D) comparing the set of hash values received at the second data processing system with stored hash values representing resources accessible from a system other than the second data processing system to identify a match between a received hash value and a stored hash value (Paragraph 24); and

E) in response to identifying a match between a received hash value and a stored hash value, accessing from said other system the resource represented by the matching hash value (Paragraph 24).

The examiner notes that **Vermeulen** teaches **"computing a set of hash values representing a set of resources stored in a directory at the first data processing system"** as "a basic idea of this invention is to compute a hash code from a file via a given algorithm and to use this hash code to check whether a file to be loaded is already contained in the cache or not" (Paragraph 20) and "Server 14 then computes the hash code of this file 23" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"generating a directory template representing the structure of the directory including the locations within the directory of the resources represented by the set of hash values"** as "Directory 52 contains a list of the hash codes of the stored files and, for each hash code, the memory address at which the associated file is stored in the second memory area 53" (Paragraph 32). The examiner further notes that **Vermeulen** teaches **"sending the set of hash values and the directory template to the second data processing system"** as "Client therefore sends a file request 21 with the address of the requested file to proxy server 12. To be able to check its cache as to whether the requested file is contained therein, proxy server 12 needs the hash code belonging to the file. It therefore sends to remote server 14 a hash request 22 in which the requested file is specified with its address. Server 14 then computes the hash code of this file, 23, and sends a message containing the computed hash code back to the Proxy server" (Paragraph 24) and "it is advantageous if the servers of a distributed file system compute the hash codes of the respective files in response to each relating to one or more file, e.g., in response to a request for a directory of a subdirectory, and dispatch them" (Paragraph 34). The examiner further notes that **Vermeulen** teaches **"comparing the set of hash values received at the second data processing system with stored hash values representing resources accessible from a system other than the second data processing system to identify a match between a received hash value and a stored hash value"** as

"Proxy server 12 compares the hashes, 25, to determine whether the requested file is contained in the cache memory or not" (Paragraph 24). The examiner further notes that **Vermeulen** teaches **"in response to identifying a match between a received hash value and a stored hash value, accessing from said other system the resource represented by the matching hash value"** as "If the file is already in the cache, it will be immediately transferred, 28, to the client" (Paragraph 24).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Vermeulen** (U.S. PGPUB 2001/0042171) as applied to claims 1-2, 6-18, and 30 and in view of **Carpentier et al.** (U.S. PGPUB 2004/0068652).

13. Regarding claim 3, **Vermeulen** does not explicitly teach a method comprising:

A) initiating retrieval of the required resource via said bandwidth-sensitive connection in parallel with initiating retrieval of the required first resource from said at least one data processing system.

Carpentier, however, teaches **"initiating retrieval of the required resource via said bandwidth-sensitive connection in parallel with initiating retrieval of the required first resource from said at least one data processing system"** as "Multiple silos on a network may be configured in parallel so that different silos store the same information. Thus, when an asset is requested by a client, that information may be provided by any of the silos which happen to have the asset. In one embodiment, the silo that responds to a request is selected simply by allowing the silo which is able to respond first be the one that responds to the asset request" (Paragraph 51).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Carpentier's** would have allowed **Vermeulen's** to provide a method for allowing a large amount of flexibility in determining which silos respond to a given request and how much redundancy of stored information is provided, as noted by **Carpentier** (Paragraph 51).

Regarding claim 4, **Vermeulen** does not explicitly teach a method comprising:

A) responding to receipt of said required first resource from either one of said bandwidth-sensitive connection or said at least one data processing system by terminating in-progress retrieval operations relating to said required first resource.

Carpentier, however, teaches **"responding to receipt of said required first resource from either one of said bandwidth-sensitive connection or said at least one data processing system by terminating in-progress retrieval operations relating to said required first resource"** as "Multiple silos on a network may be configured in parallel so that different silos store the same information. Thus, when an asset is requested by a client, that information may be provided by any of the silos which happen to have the asset. In one embodiment, the silo that responds to a request is selected simply by allowing the silo which is able to respond first be the one that responds to the asset request. In this manner, the silo that can most quickly give the information is allowed to do so; when other silos that also have the information see that the request has been responded to, they need not respond" (Paragraph 51).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Carpentier's** would have allowed **Vermeulen's** to provide a method for allowing a large amount of flexibility in determining which silos respond to a given request and how much redundancy of stored information is provided, as noted by **Carpentier** (Paragraph 51).

14. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Vermeulen** (U.S. PGPUB 2001/0042171) as applied to claims 1-2, 6-18, and 30, and in view of **Carpentier et al.** (U.S. PGPUB 2004/0068652) as applied to claims 3-4, and further in view of **Sekiguchi et al.** (U.S. Patent 6,434,553).

15. Regarding claim 5, **Vermeulen** and **Carpentier** do not explicitly teach a method comprising:

A) wherein the step of initiating retrieval of the required resource from said at least one data processing system comprises initiating retrieval of resource size information and initiating retrieval of the bit sequence of said resource in a reverse order relative to the retrieval of said resource via the bandwidth-sensitive connection; and

B) combining portions of the bit sequence of said resource received via the bandwidth-sensitive connection and received from said at least one data processing system to build the bit sequence of said resource.

Sekiguchi, however, teaches **"wherein the step of initiating retrieval of the required resource from said at least one data processing system comprises initiating retrieval of resource size information and initiating retrieval of the bit sequence of said resource in a reverse order relative to the retrieval of said resource via the bandwidth-sensitive connection"** as "converting a request to access any one of partial files using the corresponding partial file name into a request to access the entire file to which the requested file belongs; whereby the file as a whole is read out...a plurality of partial files which tend to be read out consecutively are managed as a single file" (Column 2, lines 48-55) and **"combining portions of the bit sequence of said resource received via the bandwidth-sensitive connection and received from said at least one data processing system to build the bit sequence of said resource"** as "converting a request to access any one of partial files using the corresponding partial file name into a request to access the entire file to which the requested file belongs; whereby the file as a whole is read out...a plurality of partial files which tend to be read out consecutively are managed as a single file" (Column 2, lines 48-55).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Sekiguchi's** would have allowed **Vermeulen's** and **Carpentier's** to provide a method for allowing storage mediums to accommodate files efficiently and prevent deterioration of the file system throughput, as noted by **Sekiguchi** (Column 2, lines 63-67).

16. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Vermeulen** (U.S. PGPUB 2001/0042171) as applied to claims 1-2, 6-18, and 30 and in view of **Alshab et al.** (U.S. PGPUB 2005/0138081).

17. Regarding claim 31, **Vermeulen** teaches a method comprising:

A) for each of a set of data processing systems, computing a set of hash values representing a set of resources stored within the respective data processing system (Paragraphs 24 and 32);

B) storing the set of hash values for each of the set of data processing systems in at least one repository (Paragraph 24);

The examiner notes that **Vermeulen** teaches **"for each of a set of data processing systems, computing a set of hash values representing a set of resources stored within the respective data processing system"** as "a basic idea of this invention is to compute a hash code from a file via a given algorithm and to use this hash code to check whether a file to be loaded is already contained in the cache or not" (Paragraph 20) and "Server 14 then computes the hash code of this file 23" (Paragraph 24), and **"storing the set of hash values for each of the set of data processing systems in at least one repository"** as "Directory 52 contains a list of the hash codes of the stored files" (Paragraph 32).

Vermeulen does not explicitly teach:

C) in response to a failure affecting resources stored at a data processing system within the set of data processing systems, comparing the set of hash values stored in the repository for the affected data processing system with the stored hash values for other data processing systems within the set of data processing systems, to identify resources stored within said other data processing systems having hash values matching resources of the affected data processing system; and

D) restoring, to the affected data processing system from said other data processing systems, identified resources having hash values matching resources of the affected data processing system.

Alshab, however, teaches "**in response to a failure affecting resources stored at a data processing system within the set of data processing systems, comparing the set of hash values stored in the repository for the affected data processing system with the stored hash values for other data processing systems within the set of data processing systems, to identify resources stored within said other data processing systems having hash values matching resources of the affected data processing system**" as "When the Archive Server detects a change to a monitored file, it compares the Hash code of the original data...marks the version as tampered in the Version Header and the Hash Table for the file is not updated" (Paragraph 150) and "**restoring, to the affected data processing system from said other data processing systems, identified resources having hash values matching resources of the affected data processing system**" as "When restoring a file from the Archive Server to the client...in the Version Header" (Paragraph 151).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Alshab's** would have allowed **Vermeulen's** to provide a method for quickly become aware of events and react to a solution in near-real time, as noted by **Alshab** (Paragraph 16).

18. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Vermeulen** (U.S. PGPUB 2001/0042171) as applied to claims 1-2, 6-18, and 30 and in view of **Margolus et al.** (U.S. PGPUB 2002/0038296).

19. Regarding claim 32, **Vermeulen** teaches a method comprising:

A) for each of a set of data processing systems, computing a set of hash values representing a set of resources stored within the respective data processing system (Paragraphs 20 and 24).

The examiner notes that **Vermeulen** teaches **"for each of a set of data processing systems, computing a set of hash values representing a set of resources stored within the respective data processing system"** as "a basic idea of this invention is to compute a hash code from a file via a given algorithm and to use this hash code to check whether a file to be loaded is already contained in the cache or not" (Paragraph 20) and "Server 14 then computes the hash code of this file 23" (Paragraph 24).

Vermeulen does not explicitly teach:

B) storing the set of hash values for each of the set of data processing systems in at least one repository, together with a timestamp relating to the time at which the hash value was computed and a path within the respective data processing system at which the resource represented by the hash value is located;

C) in response to a requirement for a particular version of a resource at a particular time, using the hash value, timestamp and path stored in the repository to identify a relevant resource.

Margolus, however, teaches **"storing the set of hash values for each of the set of data processing systems in at least one repository, together with a timestamp relating to the time at which the hash value was computed and a path within the respective data processing system at which the resource represented by the hash value is located"** as "The actual timestamp record 78 consists of a list of cryptographic hashes 80, one per version selected for times-tamping. Each hash includes an access identifier 71i for a version of an object as well as a dataname 76i associated with the version" (Paragraph 142) and **"in response to a requirement for a particular version of a resource at a particular time, using the hash value, timestamp and path stored in the repository to identify a relevant resource"** as "If proof of existence is ever required for a particular version of an object which is still in the repository, its timestamp hash can easily be located within the timestamp data-item 78 for the relevant repository server 70" (Paragraph 143).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Margolus's** would have allowed **Vermeulen's** to provide a method for allowing storage systems to identify previous versions of data, as noted by **Margolus** (Paragraph 9).

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent 6,883,135 issued to **Obata et al.** on 19 April 2005. The subject matter disclosed therein is pertinent to that of claims 1-18, 30-32 (e.g., methods to quickly obtain requested files remotely via hash comparison).

U.S. Patent 6,647,421 issued to **Logue et al.** on 11 November2003. The subject matter disclosed therein is pertinent to that of claims 1-18, 30-32 (e.g., methods to quickly obtain requested files remotely via hash comparison).

U.S. Patent 6,212,521 issued to **Minami et al.** on 19 August 2004. The subject matter disclosed therein is pertinent to that of claims 1-18, 30-32 (e.g., methods to quickly obtain requested files remotely via hash comparison).

U.S. Patent 6,098,079 issued to **Howard** on 01 August 2000. The subject matter disclosed therein is pertinent to that of claims 1-18, 30-32 (e.g., methods to quickly obtain requested files remotely via hash comparison).

U.S. Patent 6,754,657 issued to **Lomet** on 22 April 2004. The subject matter disclosed therein is pertinent to that of claims 1-18, 30-32 (e.g., methods to quickly obtain requested files remotely via hash comparison).

Contact Information

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mahesh Dwivedi whose telephone number is (571) 272-2731. The examiner can normally be reached on Monday to Friday 8:20 am – 4:40 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Vo can be reached (571) 272-3642. The fax number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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August 17, 2006

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